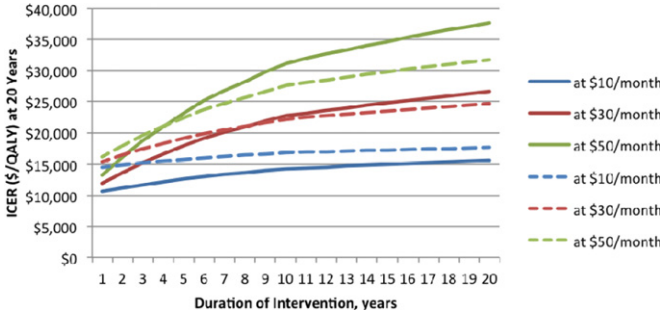

http://dx.doi.org/10.1016/j.krcp.2012.04.519

196

VITAMIN D SUFFICIENCY IN HEMODIALYSIS PATIENTS AND ITS ASSOCIATION WITH NUTRITIONAL AND CLINICAL PARAMETERS

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Renal failure is a complicating factor in the maintenance of vitamin D adequate levels, which can interfere in the patients' nutritional status. The aim of this study was to evaluate the association of serum 25-hydroxyvitamin D [25(OH)D] with clinical and nutritional parameters. Prevalent hemodialysis (HD) patients were submitted to a single evaluation about demographic characteristics, clinical data and laboratory measurements. Anthropometric measurements and electrical bioimpedance were performed to obtain BMI, percentage of standard MAMC (%MAMC), fat percentage (%Fat) and phase angle (PA). Deficiency was defined as a 25(OH)D level < 15 ng/mL, insufficiency as 15-30 ng/mL and sufficiency as > 30 ng/mL. Univariate models were constructed and the variables associated with 25(OH)D sufficiency were included subsequently in the multiple regression model. Statistical significance was $p < 0.05$.One hundred twelve patients (59 male, 53 female) were included. Twenty seven (24.1%) were 25(OH)D deficient, 43 (38.4%) insufficient and 42 (37.5%) sufficient. In univariate regression, creatinin, albumin and PA were positively associated with serum 25(OH)D, while age, glucose, BMI and %MAMC were negatively associated. In multivariate regression, age and %MAMC were negatively associated with sufficiency. Most studied sample showed inadequate 25(OH)D levels. In our study, the result to be highlighted was the negative associations of 25(OH)D sufficiency with age and %MAMC, but all the findings suggest that fat interferes with vitamin D stores in HD patients.

http://dx.doi.org/10.1016/j.krcp.2012.04.520

197

RELATIONSHIPS AMONG EGFR, VITAMIN D METABOLITES AND PTH 1-84 IN CKD.

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Vitamin D undergoes 25-hydroxylation in the liver (25D) and 1-alpha hydroxylation in the kidney (1,25D). Both [25D] and [1,25D] fell with GFR in surveys of patients with CKD. Because 1,25D suppresses transcription of the PTH gene, low [1,25D] is thought to be a cause of high [PTH] in CKD. To examine relationships among eGFR, [PTH] 1–84 (Scantibodies), [25D], and [1,25D], we studied 8 normal subjects with eGFR 73–103 and 29 patients with eGFR 14–49 ml/min/1.73 m^2. Most patients had been taking supplemental vitamin D. Means (SEM) were compared by two-tailed t-test, and regressions were examined as indicated below. Results are summarized in the tables.

Variable	CKD (n=29)	Nl (n=8)	p
eGFR (ml/min/1.73 m^2)	30.0 (1.7)	88.6 (4.0)	< 0.001
[PTH] pg/ml	80.6 (8.6)	30.1 (3.7)	0.005
[25D] ng/ml	35.2 (2.5)	39.7 (3.4)	0.4
[1,25D] pg/ml	42.5 (3.6)	55.1 (4.8)	0.1

	CKD (n=29)		Nl (n=8)	
Regression	R^2	p	R^2	p
[PTH] on eGFR	0.36	< 0.001	0.13	0.4
[25D] on eGFR	0.001	0.9	0.01	0.8
[1,25D] on eGFR	0.20	0.014	0.12	0.4
[1,25D] on [25D]	0.37	< 0.001	0.18	0.3
[PTH] on [25D]	0.02	0.5	0.03	0.7
[PTH] on [1,25D]	0.03	0.4	0.003	0.9

In comparison to normal subjects, patients with CKD had lower eGFR, higher [PTH], and similar [25D] and [1,25D]. In the patients with CKD, [1,25D] varied directly and [PTH] inversely with eGFR. Unlike [1,25D], [25D] was not associated with eGFR, but [1,25D] nevertheless correlated strongly with [25D]. [PTH] was not related to [25D] or [1,25D]. In our patients with CKD, many of whom were vitamin D-replete, [25OHD] was the principal determinant of [1,25D]. Increased [PTH] could not be attributed to decreased [1,25D].

http://dx.doi.org/10.1016/j.krcp.2012.04.521

198

PROFILE OF SERUM AMINO ACIDS IN PATIENTS ON PERITONEAL DIALYSIS

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Patients on peritoneal dialysis (PD) are predisposed to disturbances in amino acid metabolism and development of malnutrition which are unfavorable prognostic factors. Studying the serum level of essential amino acids in patients on PD. The total of 56 PD patients (mean age 42.4 ± 11.5 years, treatment duration 24.0 ± 14.2 months) was examined simultaneously with 12 practically healthy volunteers (mean age 39.4 ± 10.7 years). Analysis of the dietary interviews and 3-day dietary journals was carried out. The levels of essential and conditionally essential amino acids in both serum and daily volume of peritoneal dialysis solution were determined using liquid chromatography.

Dietary protein consumption in PD patients was 1.06 ± 0.09 vs. 1.21 ± 0.05 g/kg/day ($p < 0.05$) in the control group. Decreased serum levels of 6 essential amino acids were registered (valine, lysine, threonine, and tyrosine – almost 2 fold ($p < 0.05$), leucine and isoleucine – by 28 and 34% ($p < 0.05$), accordingly, as well as normal concentration of phenylalanine and methionine – 0.6 ± 2.3 and 9.4 ± 2.1 mg/L, correspondingly, vs. 11.1 ± 0.8 and 11.3 ± 0.8 mg/L in the control ($p > 0.05$), and increased level of histidine – 32.7 ± 6.8 vs. 14.6 ± 0.5 mg/L in the control. The ratios essential/nonessential amino acids and branched/replaceable amino acids as well as Fisher's index were 0.54 ± 0.05, 0.25 ± 0.05 and 2.0 ± 05, correspondingly, vs. 1.35 ± 0.15, 0.55 ± 0.05 and 3.2 ± 0.2 in the control ($p < 0.05$). Daily excretion of essential amino acids with dialysis solution fluctuated between 314 and 522 mg, and that of conditionally essential amino acids – between 156 and 337 mg. Direct correlation was revealed between daily excretion of essential amino acids, on the one hand, and both peritoneal transport ($p=0.001$) and daily excretion of isoleucine, threonine, histidine, and their serum levels, on the other ($p=0.04$, $p=0.001$, and $p=0.01$, accordingly). Direct correlation between daily excretion of essential amino acids and that of tyrosine and its serum level was only near reliable value ($p=0.055$). PD patients are characterized by the markedly unbalanced level of essential amino acids. The deficiency of the majority of essential amino acids in PD patients is due to their high loss through dialysis solution and insufficient protein consumption.

http://dx.doi.org/10.1016/j.krcp.2012.04.522

199

GERIATRIC NURRITIONAL RISK INDEX IN DIAGNOSTICS OF MALNUTRITION IN PATIENTS ON PERITONEAL DIALYSIS

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Malnutrition is a prevalent concomitant disease in patients with chronic renal failure (CRF) on peritoneal dialysis (PD). Assessment of nutritional status is a necessary component of the complex treatment of these patients. Studying imformativeness of the geriatric nutritional risk index